

Long-run Strategic Planning for Alaska's Ports and Harbors

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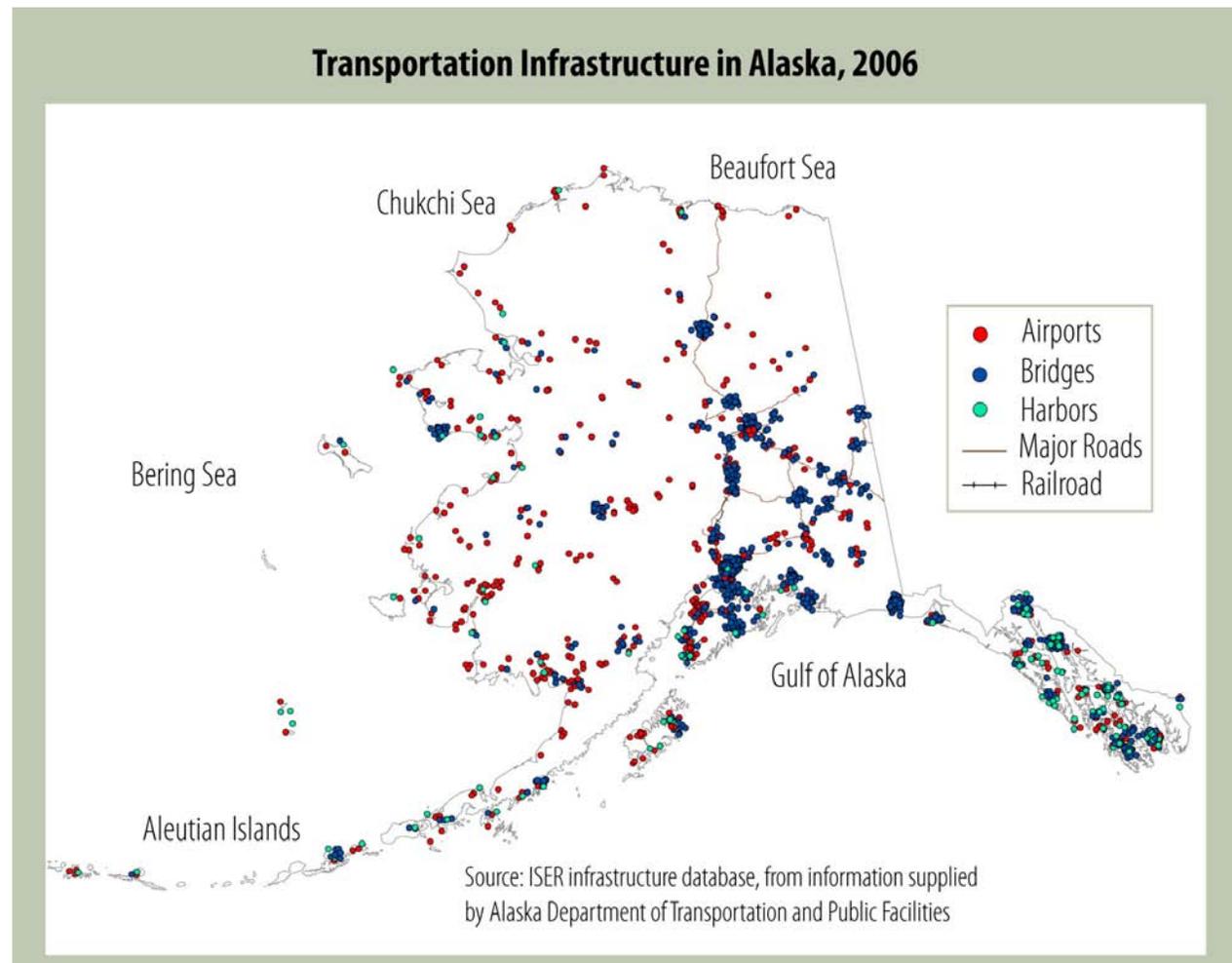
About The Nature Conservancy...

The Nature Conservancy works in more than 30 countries, including all 50 United States.

The Conservancy has nearly one million members.

To date, we have protected over 100 million acres of land and 5,000 miles of rivers worldwide.

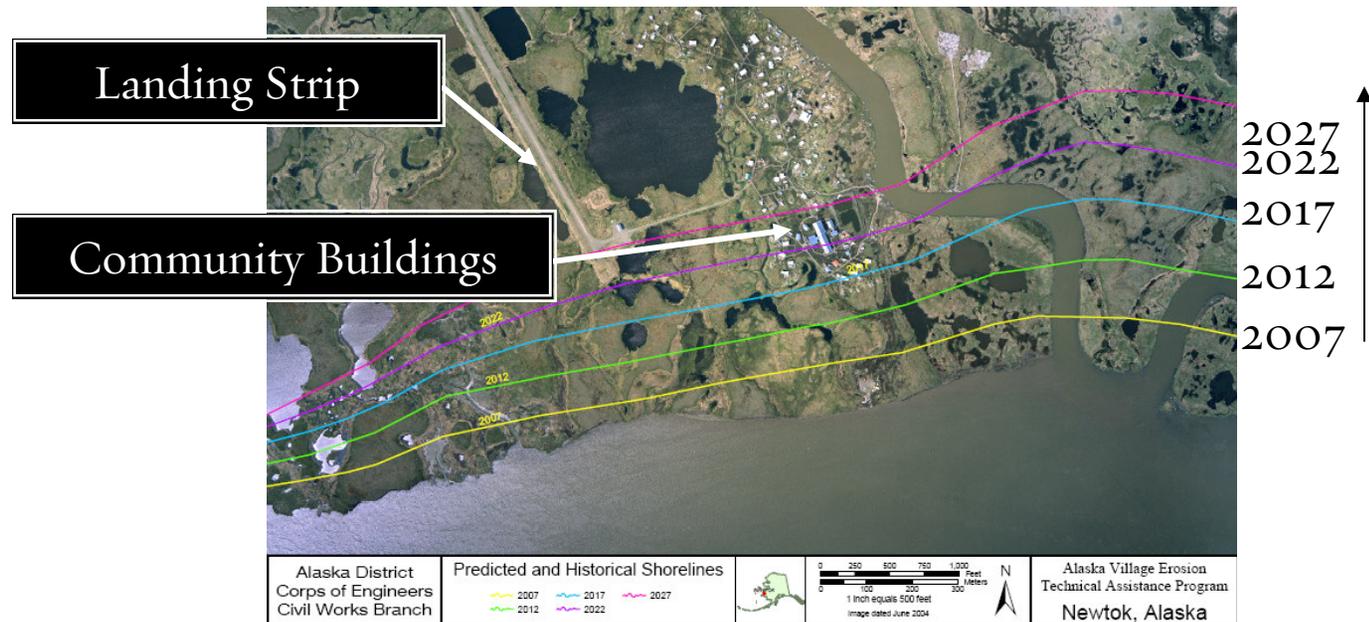
Location of Public Infrastructure



Source: M. Wilson (2007)

ISSUE: Accelerated Coastal Erosion

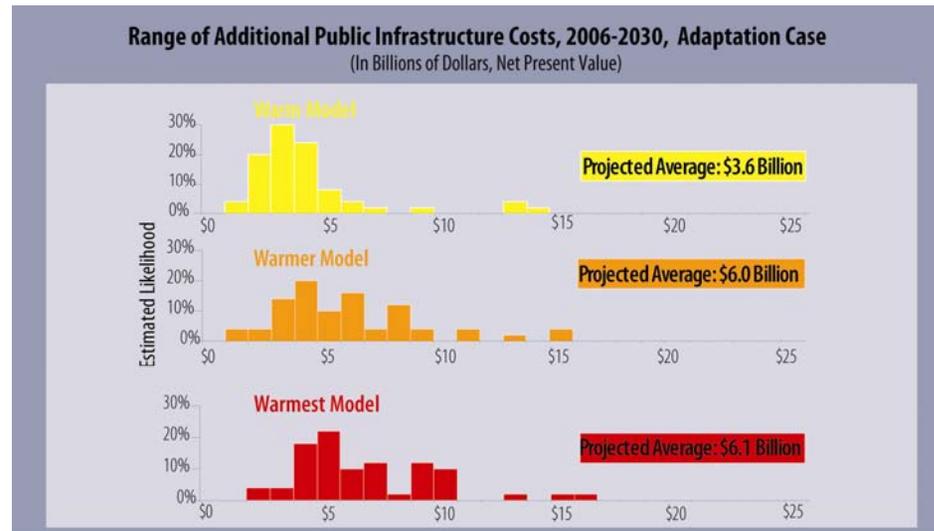
Projected Coastal Erosion at Newtok, Alaska (USACE, 2006)



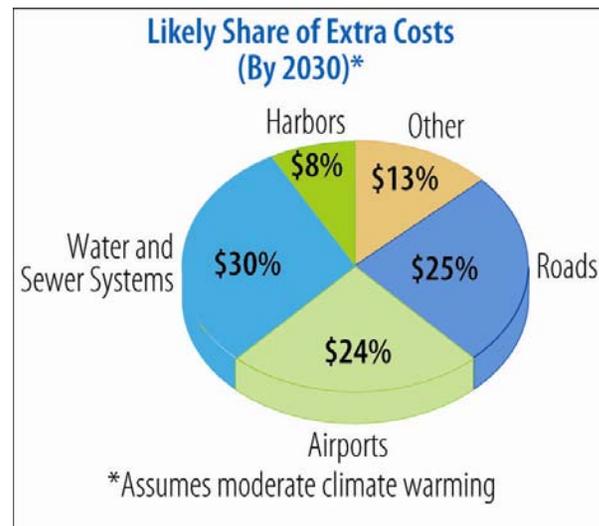
Coastal Storm Activity Undermines Foundations in Western Alaska (USACE, 2006)



ISSUE: Public Infrastructure at Risk to Climate Change



Assumes Adaptation

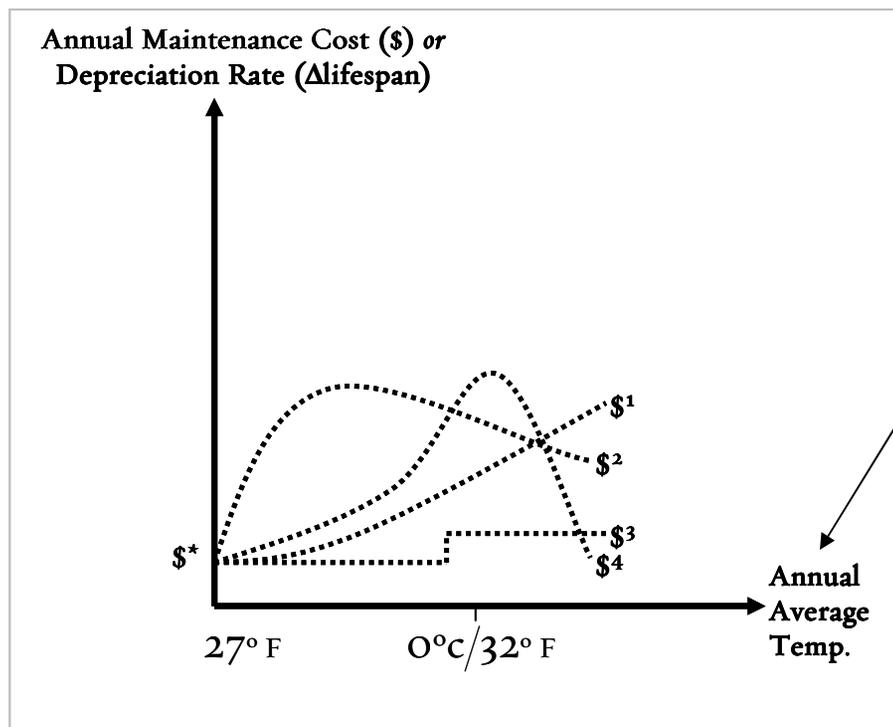


Source: Larsen et al (2007)

SUGGESTION: Estimate Financial Vulnerability of Ports/Harbors

- Engineers/planners should consider developing cost functions relating structural useful life changes to projected environmental changes.

Hypothetical Damage Functions for Fuel Tank Farm on Thawing Permafrost



For ports, consider varied sea level, ice, and storm surge conditions.

ISSUE: Risk to Arctic Marine Ecosystems from Climate Change



Source: J. Grebmeier (2008)

- Bering Sea and Arctic Ocean marine ecosystems will continue to be stressed from:
 - I. Rapidly changing environmental conditions
 - II. Increased marine traffic/resource development

SUGGESTION: Strategically Invest in Ports Assuming Fundamentally Different Ecosystem Conditions



Source: J. Grebmeier (2008)

- State-of-the-art climate/ice projections could be used by resource planners, private companies, and conservation groups to design optimal marine shipping/resource access routes that both minimize travel time and impacts to “stressed” Arctic ecosystems.

Conclusion

- Effects of rapid climate change are being observed in many parts of Alaska and the Arctic. **In addition to public infrastructure (including ports/harbors), other social and natural systems may be especially vulnerable to climate change.**

- Consider strategically investing in ports/harbors that satisfy *dual* criteria of:
 - I. protecting at-risk ecosystems (e.g., spill response, etc.) and
 - II. responding to increased marine traffic because of rapidly changing environmental conditions.

Additional Information

- All materials for the economics study can be accessed at: www.iser.uaa.alaska.edu
- Alaska Center for Climate Assessment and Policy (ACCAP): www.uaf.edu/accap/
- The Nature Conservancy: www.nature.org

Questions?